

## CLAIMS

What is claimed is:

1. A method for forming consumable electrodes from metal chip scraps, the steps comprising:  
crushing said chip scraps into particles;  
cleaning said particles;  
vacuum-thermal degassing (VTD) said particles;  
cold pressing said particles into briquettes;  
placing said briquettes into a mould, said mould having sufficient remaining space to receive the addition of molten metal alloy;  
pre-heating said mould with briquettes, prior to addition of molten metal alloy, up to a temperature sufficient to assure adhesion of said briquettes to said molten metal alloy;  
filling remaining mould space with said molten metal alloy;  
cooling said mould and consumable electrode formed therein to ambient temperature.
2. The method in accordance with claim 1, wherein said particles' sizes are in the range of 5 -20 mm.
3. The method in accordance with claim 1, wherein said cleaning step comprises degreasing said chip scraps; washing and drying said degreased chip scraps; subjecting said dry chip scraps to magnetic separation.
4. The method in accordance with claim 1, wherein said VTD step comprises:  
subjecting said particles to an environment comprising a temperature in the range of 550 - 650 deg C and pressure of  $5 \times 10^{-3}$  mm of mercury for a time in the range of 1 - 2 hours;  
maintaining said vacuum pressure while said particles cool to 200 deg C; and lastly

cooling said particles to ambient temperature.

5. The method in accordance with claim 1, wherein the relative density of said briquettes is in the range of 0.6 - 0.75.
6. The method in accordance with claim 1, wherein said mould pre-heating temperature is selected from temperatures in the range of 400 - 450 deg C.
7. The method in accordance with claim 1, further comprising the step of introducing inert gas into the furnace holding the mould after said molten alloy filling step, to lessen the cooling time.
8. The method in accordance with claim 7, wherein said inert gas is chosen from the group consisting of helium and argon.
9. The method in accordance with claim 1, wherein said metal is titanium.